E-Grants
Technology Evaluation

Evaluate the use or expansion of
interagency and agency specific capabilities
for discretionary grant programs
including COTS programs

May 31, 2002

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I. Executive Summary

TECHNOLOGY EVALUATION OBJECTIVES

The initial rollout of the Federal E-Grants initiative focuses on the "Front Office" – the customer-facing aspects of the grant lifecycle. It will provide the public with a simple and unified mechanism for finding and applying for Federal Financial Assistance, the first phase being Discretionary Grant Programs. The objective is to deploy a unified discretionary grant application mechanism no later than October 2003.

To meet this objective, a working group was charged with evaluating existing Federal, State and local grant systems as well as commercial-off-the-shelf (COTS) packages that could be used for rapid application deployment. Working group members were representatives from the Departments of Health and Human Services, Housing and Urban Development, and Education. The technology evaluation used a three-pronged approach in evaluating technologies to support finding and applying for Federal financial assistance:

(1) Find and assess existing commercial products and capabilities;

(2) Determine if there are existing Federal systems that are candidates for Government-wide expansion in accord with the Enterprise Architecture recommended in the E-Grants Business Case and which address the "front office" needs of finding and applying for grants; and

(3) Sample customer best practices for lessons learned in deployment or use of electronic grant applications.

Summary Results

The technology evaluation found three Federal Systems that may be candidates for expansion or may offer significant design concepts that could be used for the E-Grants Front Office solution. In addition, the evaluation found a number of commercial-off-the-shelf (COTS) products that offer solutions or could be used in part for the solution.

The findings indicate the following:

- An Integrator will be essential for the success of the project. The integrator will configure, customize and build required solution components. The integrator may be independent from some of the software development or be part of the software development team.
- Additional demonstrations of the Federal and COTS products are needed to determine what functionality is covered by the product, and fully identify strengths and weaknesses
- As solutions are selected, a cost-benefit analysis should be developed
- Due to the internal operational diversity of the 26 Federal agencies, customer-facing workflow processes should be kept to a minimum.
- Cost-sharing, e.g., a contractor-owned system, may carry considerable long term cost implications and does not appear to be a viable solution at this time.

- Authentication will work within Government-wide solutions. E-Grants will provide capabilities to upgrade to digital signatures.

Next steps are to demonstrate candidate products before a Federal review team composed of a broader array of Federal agencies, followed by a cost-benefit analysis. All selected products and contract vehicles need to be in place by October 2002 to achieve E-Grants deployment by October 2003.

II. Introduction

BACKGROUND

E-Grants, one of 24 E-Gov initiatives in the Management Agenda of President George W. Bush, will create a simplified, unified electronic storefront for grants interactions between the applicant/grantee community and the Federal agencies that manage Federal funds. E-Grants will eliminate the disparate and paper-based processes that serve as hurdles to organizations attempting to find and apply for funding opportunities, receive notification of an award and then manage their grants. By simplifying application requirements and processes, standardizing data, and unifying the mechanisms for interaction with the grant-making agencies, E-Grants will transform the grant process for both the grantor and grantee communities.

States, local and Indian tribal governments; universities; public housing agencies; and non-profit organizations have repeatedly voiced concern that multiple application and reporting requirements, as well as the proliferation of electronic grant management systems, has created a staffing and financial hardship for those interested in receiving Federal grants and other financial assistance. In response to this growing concern, Congress passed Public Law 106-107, the Federal Financial Assistance Management Improvement Act of 1999, which mandated that the federal grant making agencies work together to simplify requirements and establish common reporting requirements. The E-Grants effort is working to expand upon the simplification work done under PL 106-107 and develop an electronic system which will use uniform processes and data standards for all application submissions and reporting on Federal grants being managed by any Federal agency. The simplified processes to be implemented by the E-Grants initiative will reduce the economic and administrative burden for the grant community, and result in more efficient operations for grantees and the Federal agencies responsible for grants management and oversight. E-Grants will also allow applicants and grantees easier access to the information needed to manage Federal grants.

The E-Grants initiative will focus on the "Front Office" – the customer-facing aspects of the grant lifecycle. By focusing on the "Front Office" aspects, the E-Grants initiative will make a unified, simplified single set of processes available to citizens and organizations interested in funding opportunities, applicants and awardees. This will become the one-stop, electronic "storefront" where emerging e-business technologies and best practices are used to give grantees full service grants processing across all functions in the grants life cycle. The E-Grants storefront will be the single point of entry for grantees, offering both full general information exchange and secure e-business transaction processing.

Vision, Goals and Objectives: The E-Grants Vision, Goals and Objectives are listed in the Appendix of Business Case References. This report directly addresses the objective of E-Grants "to evaluate the use or expansion of interagency and agency specific capabilities for discretionary grant programs including commercial-off-the-shelf (COTS) packages." This evaluation must also address technology solutions for the other objectives of finding grant opportunities and applying for grants.

Initially E-Grants must include:

(1) A simple, unified way to find Federal grant opportunities via the Web;

(2) Defining grant application data standards; and

(3) A unified application mechanism.

In the future E-Grants will extend its scope to include unified "store front" access to reporting, payment; mandatory grants and other programs.

E-Grants Information Technology (IT) Architecture. The E-Grants information technology architecture is described in the E-Grants Business Case. The IT Architecture Overview, contained in an appendix of this report, recommends an integration strategy with two tiers of service for a web-based solution that is scalable, meets technical standards, and adequately addresses security and privacy requirements. The integration strategy recommends avoiding proprietary products and protocols that require agency investment or buy-in. The strategy focuses on meeting standards as they currently exist yet allowing for further use of COTS packages as the market matures. The recommended Architecture is consistent with Government-wide Enterprise Architecture being recommended for the E-Government initiatives.

Experience of the Federal Commons Portal Pilot: A pilot project under the Federal Commons, a predecessor of the E-Grants solution, successfully used COTS portal software to demonstrate the effectiveness of using a COTS package for rapid deployment and easy interface with other web-based applications. In only 55 days, the portal pilot demonstrated that software could be used to "crawl"other systems to collect information from multiple sources related to grants and other items of interest to the grantee community, array the information in various ways convenient to the customer and serve multiple customer needs simultaneously. The rapid deployment of the portal pilot demonstrates how far web-based technology solutions have advanced and how they can be adapted to serve the needs of the E-Grants project.

III. Description of Task

PURPOSE

The purpose of this report is to address one of the objectives of E-Grants "to evaluate the use or expansion of interagency and agency specific capabilities for discretionary grant programs including commercial-off-the-shelf (COTS) packages". The evaluation focuses specifically on identifying a product to be used to deploy a simple, unified application mechanism and to integrate finding funding opportunities, identifying organizations and transferring data to agency systems.

The purpose of this evaluation is to:

- Determine if existing agency and/or interagency investments can be leveraged for this the E-Grants Initiative;
- Ensure the E-Grants Initiative does not "re-invent the wheel" while providing the E-Grants storefront functionality;
- Find the most cost effective and the best solution for initial deployment;
- Survey existing products and systems and evaluate their potential for the identified E-Grants storefront;
- Examine best practices and identify key lessons learned in implementing large scale technology solutions; and
- Seek innovative ideas in design, architecture, project management and solution integration.

In addition to determining the best solutions for initial deployment, it is vital that flexible solutions be developed that enable future expansion and enhancement to meet eventual and emerging needs. Solution for authentication, security, accessibility and overall enterprise architecture will have to be coordinated with other E-gov electronic solutions.

APPROACH

Commercial products and services – In January 2002 the Department of Health and Human Services published a request for information (RFI) (Reference Number: RFI-4-02-HHS-OS, "Bi-Directional Exchange Information and Methodology"). The responses were due February 11, 2002. Seventy-five responses were received. Those responses were evaluated and used as part of a survey of existing products and services for electronic solutions to search and apply for discretionary grant programs. In addition, the responses were examined for concepts to implement large-scale technology solutions and for suggestions of innovative ideas in design, architecture, project management and solution integration. The results of that technology examination are summarized in this report.

Since many of the vendor responses received contained proprietary information and since there was no easy way of making direct comparisons, a voluntary follow up survey was requested from each of the vendors in order to gather uniform information that could be shared publicly. The survey results are found in the Survey Results Appendix.

There was a strong response from the vendor community of possible solutions indicating a strong interest and excellent capabilities for integrated services and products. Information from the RFI was grouped, compared and analyzed for content. Responses to the follow-up vendor survey were compiled. Forty-five follow-up surveys were completed. A summary can be found in the Survey Results Appendix.

Federal technology solutions – In April 2002 the E-Grants Program Management Office requested Federal agencies to submit information on existing systems the agency considered as possible candidates for expansion or for benchmarking for grants administration processes, specifically for finding opportunities or applying for grant programs. Responses were due April 29, 2002. Fourteen candidate systems or methodologies were submitted.

The Federal surveys were compiled and analyzed for potential immediate solutions to applying for discretionary grants. They were also reviewed for open, expandable architecture to allow for expansion for future data collection for grant recipient reports and for open-ended or close-ended mandatory grant program submissions.

Customer practices sampled – In September, 2001 the Department of Health and Human Services let a contract to American Productivity and Quality Center (APQC) to "conduct a study using benchmarking tools that focuses on activities related to grant-making" (Reference No.: HHS-100-01-0024). As part of their efforts APQC surveyed selected grant recipient organizations including states, universities and foundations with grant or financial systems to elicit information from them on technology best practices and lessons learned. Some of these responses are include in the Results Section.

APQC compiled the results of the customer surveys and produced a consolidated list of best practices and lessons learned. No customer technology solution emerged as a candidate for Federal use. The value of the responses is in the suggestions of ways to proceed.

Review process – A Federal review was then conducted of all of the results. This review balanced requirements for:

(1) E-Grants IT Architecture requirements and recommendations *(scalable, meeting technical standards, and addressing security and privacy)*

(2) Feasibility of implementing a robust, affordable solution within the time constraints of the E-Grants objectives

(3) Functionality *(Initial functions of finding opportunities and applying for discretionary grants should be expandable to reporting functions and mandatory grant programs, and may have the need for project objectives to later be tied to reported results and benefits.)*

(4) Flexible interfaces *(Some of the future functions of E-grants processes can be served by facilitating interfaces with existing systems such as finding funding opportunities via FedBizOpps, identifying organizations through an Independent Profile Vendor Network (IVPN) registry, and transferring data to and from existing systems. Flexible software solutions must be capable of managing such interfaces.)*

Other considerations in determining next steps – In addition to the result of this evaluation, the determination of next steps is also affected by E-grants' inter-relationship with other processes:

(1) Existing data definitions – The 194 grant application data elements will be used as the basis for grant application data. (See the appendix for the Background of the Grants Data Dictionary.)

(2) Federal Grants Streamlining Program – Process and data changes and updates will be coordinated with the streamlining efforts underway under Public Law 106-107.

(3) Vetting processes – The grant application data dictionary will be vetted among Federal agencies. The existing 194 data set has already undergone a period of public comment. Future changes to e-grants data dictionaries will follow a similar process of vetting by the Federal agencies and a period of public comment. The frequency of future updates is expected to be not less than 12 months.

(4) Customer outreach – Our partner grant recipient organizations are actively engaged in defining workable processes through many avenues such as the Inter-agency Electronic Grants Committee, the Inter-State Advisory Group, and the Federal Demonstration Partnership.

IV. Results

RESPONSE TO REQUEST FOR INFORMATION

Most responses proposed design concepts offering the development of full lifecycle grants management systems, which would handle the "front office" requirements of E-Grants and the "back office" functions performed by the various Agencies. There were reoccurring themes throughout the proposals of utilizing workflow, electronic forms, data storage, document management, portals and security software products. Most designs proposed utilizing existing COTS products that would be integrated and modified to meet the needs of the E-Grants storefront.

The review of the responses found that very few vendors actually have an existing grant COTS product. Many of the products are simply business or financial tool sets that would require a great deal of customization in order to accommodate the uniqueness of grants. The majority of the functionality available in some of these existing grant products address the "back office" functions, rather than the "front office" functions Others vendors have separated their grant COTS products by what appears to be logical "front office" and "back office" type functions. Review of the existing products raises the question of whether there will be decoupling issues related to unneeded functionality available in these existing grant COTS products.

One response offered a cost-share proposal of having applicants and Agencies pay to submit applications electronically via the E-Grants storefront. The costs to the applicants would not exceed the cost to FedEx a proposal and the cost to the Agencies would be so much per application. To achieve the volume of electronic applications to satisfy the cost assumptions in the proposals, mandatory participation by Agencies and applicants would have to be required across the entire Federal Government.

Few of the vendors addressed the issue of Section 508 compliance and accessibility issues. Making a product meet accessibility standards, as mandated, will impact the length of time to full implementation and may increase the overall cost on the project. Therefore, it will be essential that this issue be addressed as the process moves forward.

Half of the 75 responses to the RFI proposed solutions of integrating existing technologies. Less than 20 of the responses described company-owned COTS products that could process or be fitted to process discretionary grant applications. These COTS products offered the following solutions

- About 40% could be used for lifecycle or workflow processing;
- About 17% were "portal" software products for managing a web site;
- About 20% represented "PKI" software products for authentication;
- About 17% were forms and document management products;

Several companies shared design concepts and pertinent white papers. Some of the designs outlined concepts that may be of interest in exploring further. These included cached web pages, dynamic forms, integrated workflow document management, suites of products, PDF forms in addition to on-line forms data entry, integration with reporting functions, and inter-operating product suites.

SURVEY OF COMMERCIAL TECHNOLOGY AMONG RFI RESPONDENTS

Of the original 75 companies that responded to the RFI about half were systems integrators offering to integrate a suite of products or proposed design solutions or custom-built solutions. The follow up survey was primarily designed to understand features and capabilities of existing COTS software. Forty-five follow-up surveys were returned (about 60%) which correlates strongly to those companies who offer a specific COTS product. The comparative analysis of the surveys found most offered Web-based solutions and most offered or could be integrated with PKI solutions. Many respondents indicate they had products with functional solutions that would be relevant or usable for discretionary grant application processes.

The survey and existing literature did not assist in helping to determine how easy it would be to de-couple front-end solutions from back-end solutions. The inability to have a successful "layered" approach that allows de-coupling of front end from back-end could lead to difficulty in deployment as an enterprise "storefront" solution. A number of the products offered workflow solutions that are also more useful in backend solutions and could be very difficult to manage in the E-grants storefront process. Some products appear to be highly proprietary and may require substantial investment on the part of participating Federal agencies.

SURVEY OF FEDERAL TECHNOLOGY

Of the solutions proposed by Federal agencies, three systems appear to more comprehensively address processing discretionary grant applications and may have the ability to expand for government-wide usage.

(1) EDCAPS/GAPS/E-Grants (Department of Education) - is only system that is fully operational. Approximately 35-45 competitions within the Department of Education are using the system, which has end-to-end lifecycle functionality and supports both formula and discretionary grant programs. It supports establishment of the competition and application submission on line. The e-Grants architecture is designed around the Windows DNA model, COM, ASP, HTML. The design uses one COM object that resides on a 3-node NT web server cluster, with an Oracle 8i database.

(2) Interagency Discretionary Grant Application Project (NASA and other Federal research agencies including NIH, NSF, ONR, NOAA, CREES) – This is under development and emulates some of the features of the National Science Foundation's Fast Lane system. The proposed system uses technology compatible with the E-grants IT Architecture and is primarily designed for use by the research community. It covers the full life cycle including release of reviews, grant notification, financial reporting and electronic signatures.

(3) DGMS (Department of Housing and Urban Development) is in design and prototype phase. Development was placed on hold pending decisions on E-Grants. DGMS covers the full-lifecycle for both formula and discretionary grant programs and has data design concepts matching objectives in grant applications to financial and performance reporting. Its IT architecture design is compatible with the E-Grants IT Architecture with an Oracle database. It has links to the

HUD Program Inventory which is a searchable database of all HUD programs with detailed application submission requirements

Other nominated systems employ some excellent concepts for elements of the grant lifecycle such as finding funding opportunities or grant reporting that will be useful to consider as E-grants is implemented but do not currently represent candidate systems for government-wide expansion.

SURVEY OF SELECTED STATE, UNIVERSITY AND FOUNDATION SYSTEMS

In a customer survey of technology practices and lessons learned responses were sought primarily from large grant-making or grant-receiving organizations that are states, universities or non-profit institutions. No technology solutions emerged as a candidate for expansion for Federal use, and few distinct patterns emerged from the responses. In both this research and secondary research conducted prior to this effort, no consistently employed technologies and methods appear within the grant-making world. This is in part due to the different nature of the participants, the fact that some are grantors as well as grantees, and the absence of wide-ranging standards.

Most of the respondents have grants systems that primarily support the application, review, and reporting processes. All respondents' systems support users internal to their respective agencies, and most (71 percent) also support external users. More than half of the participating organizations segment their offices by program, product, or service, and several noted that they really segment in more than one way. While the "interagency" activity was relatively low among respondents (43 percent), all participants reported having an Executive Board or similar governing body to which they are accountable.

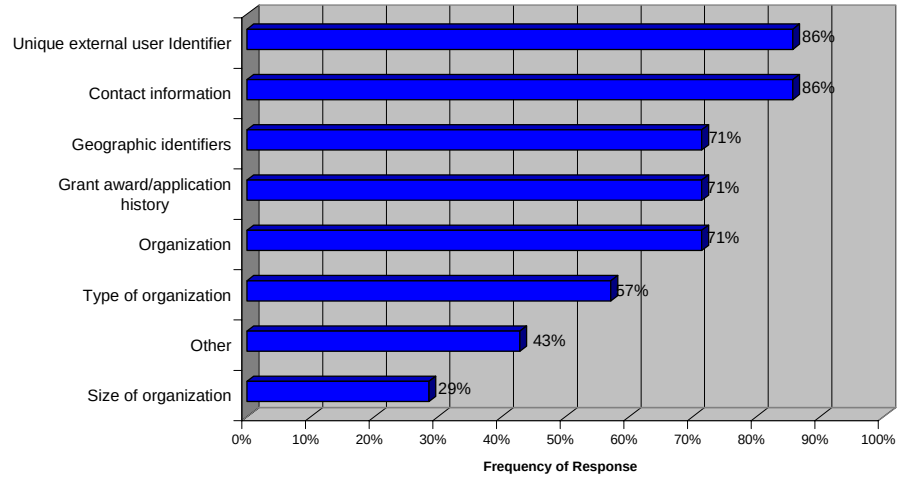
Whether grant-makers or grants recipients, the respondents were widely distributed on the scale of how many grants or grant applications they deal with in a given year. Those granting awards receive anywhere from 750 to 15,000 grant applications and award between 100 and 13,000 (averaging about 50% of applications awarded). Those receiving grants range from 1,500 to 3,000 applications per year. The kinds of communities supported were also fairly varied, although all respondents but one support university communities and most (71 percent) also support non-profit and local organizations. Researchers were the most common type of recipient supported (57 percent), and research and training were the most common functions supported by the grants programs (71 and 100 percent, respectively).

Multiple media are used to make information available to the grant communities. Eighty-six percent of the organizations rely on their own web site to provide information about opportunities to applicants. In addition other web sites, ads in publications, targeted mailings, and mass mailings to potential applicant audiences are relied upon by half of the respondents. Similarly, even in an electronic world, paper and web-enabled applications are in equal use among the respondents (57 percent each).

Identifying and contact information is used in various ways. Most participants (83 percent) capture and track the necessary contact information for external users, and the same number also capture some kind of unique user identifier (e.g., tax identification number). But most organizations (71 percent each) are also capturing the organization, the application and/or award history, and some geographic identifiers for applicants. The

"minimal data set" then for most organizations consists of more than just the name and contact information (see Chart 1, below). The majority of organizations (71 percent) do share some demographic data (equally with other program offices as with other agencies, at 43 percent each). Most (71 percent) store this information in a centralized database.

Chart 1
Minimal Identifying Data Set Captured



Perhaps not surprisingly, all respondents have at least one internal repository for storing policy and procedure information. Nearly half (43 percent) also have external sources such as websites that contain this information as well. Eighty-three percent of the participants said that this repository does incorporate information from multiple agencies or departments. In terms of who manages this repository, the most common answer (83 percent) was "other," which included "a combination of program and grants;" "contractors;" "the relevant office;" and "Corporate Headquarters."

Eighty-six percent of the respondents do have an internal grants or financial management system run primarily by internal IT staff (71 percent). Most systems (71 percent) are on-site, and are in-house systems developed as modular systems (also 57 percent). The number of internal users on the system averages 180, ranging from one organization with 10 users to one with 500; external users supported range from 20 to almost 17,000. The majority of systems (57 percent) are not, surprisingly, Section 508 accessibility compliant.

Transaction volume data and platform architecture responses were widely varied and somewhat limited. Most respondents report essentially the same platforms for both internal and external operations. Most support both web-based and client/server architectures, and utilize common technologies such as Internet Explorer, Netscape, e-mail, and Windows.

In terms of outreach and training, system users are educated through the grant agency taking the opportunity to offer information as it serves users personally through requests and other interactions. However, all of the participating organizations also provide some explicit training to users to familiarize them with the grant-making process. Most respondents (86 percent) do so through detailed information available on the web site, but the majority (71 percent) also offer public training sessions or workshops that applicants may attend. Similarly, most help desk staff are explicitly trained to act as customer

service agents and assist the users as the needs arise. Customer satisfaction feedback is sought or collected at all of the participating organizations, most (57 percent) through written surveys, and all by using messages left by customers over time as key indicators. Most of this data are tracked to be able to respond to the customer individually. It is also used for tailoring existing products or services to individual customer needs (86 percent), to develop new products or services for customers (86 percent), and as a performance measure for customer service employees or groups (57 percent).

Key insights offered as "lessons learned" from both grantors and grantees:

- "Be flexible. The whole process of establishing an online grants application system requires resources and continuous testing."
- "Utilize customer feedback to continually improve products/services. A highly-sophisticated database provides information quickly and accurately; levels the playing field for all nonprofits – they quickly desire to use and apply online process."
- "Is VERY important that whatever system is adopted for E-Grants that it include a routing and approval component that is customizable from the institution. That is, there should be no prescribed routing assumed."
- "…not to program the software to use a ROLE, but rather, use a RIGHT. In this manner, you can allow [an applicant] to package up different RIGHTS to create their own ROLE. Backing [an applicant] into a set number of 2 or 3 roles simply doesn't work well."
- "You should consider allowing institutions to create their own hierarchy while not limiting them to the depth of the hierarchy."
- "Any system that is brought up must be easy to use. If you continue to require a lot of off-line processing (routing and approval, retrieving of data, no calculated secondary costs), then many will not find the system useful and it will be hard to get agencies to buy-in to a government-wide solution."
- "Define the requirements; listen to the users; re-engineer process when necessary; design and prototype first."

V. Findings

RECOMMENDATIONS

Use of an integrator – Regardless of whether or not an existing Federal system or current COTS software is used as the solution for collecting discretionary grant applications, a systems integrator will need to be employed to smoothly merge and implement the various components of the E-grants storefront solution. The E-grants solution will have many components and over time it will have many phases. Initially it will need to combine functions of User Identification, Finding Funding Opportunities, and Applying for Grants. It is likely that both User Identification and Finding Funding Opportunities will link one or more cross-cutting Federal system solutions with E-grants solutions. The successful pilot of COTS portal software demonstrated that COTS products do exist that can be rapidly tailored to link multiple functions in a seamless interface. Use of an integrator will be critical to the successful and timely deployment.

Demonstrations of COTS – Based on the review of the proposals received in response to the Request for Information (RFI), demonstrations of existing grant COTS products will be held. We expect to invite 5-6 vendors to provide demonstrations of their products within the next month. Demonstration guidelines will be provided to each vendor on what information should be covered and the length of time allowed for the presentation. Vendors will also be asked to provide a brief written description of the company, a customer list (including references), and a description of the architecture needed to run the product as it relates to the architecture guidelines set forth in the Business Plan.

Cost-benefit analysis – As the demonstrations are conducted a careful cost-benefit analysis must also be prepared in order to ensure that the outcome of the next phase of the review process results in an affordable and reasonable set of recommendations. Because E-grants is one of many cross-cutting E-Gov initiatives, emerging Government-wide solutions will also need to be considered in this analysis.

Workflow limited – Many vendors recommended the use of a workflow product to meet the E-Grants requirements. Given that the scope of this effort is limited to the E-Grants storefront and submission of an electronic grant application, the benefits of incorporating workflow appears to be minimal. The level of effort to build and maintain the workflow process maps, the complexity of integrating a workflow product into the submission process and the cost of the workflow product licenses can not add enough value to offset the costs. Therefore, a workflow product should not be used as part of the final solution to the E-Grants storefront. . There is a critical requirement from the grant applicant community, however, to limit the submission of grant applications to those individuals with organizational authority. This requirement can be accommodated by assigning permissions to individuals (i.e., without using a complex workflow product).

Cost sharing not viable – The RFI solicited cost sharing approaches from the vendor community. The response to this request was minimal. The general approach follows:

- The Vendor builds the initial E-Grant capability and provides the requisite infrastructure to operate the capability without government funding. The costs of implementation will be amortized over a predetermined period and recovered through user fees.

- Fee per application submitted, paid by the Applicant.
- Fee per application, paid by Agencies
- User fees collected cover the operations and maintenance costs as well as the costs for enhancements and improvements.

To actually generate sufficient income from the fees, the E-Grant capability would have to be mandatory for Agencies and Applicants. Such a mandate, particularly at the initial rollout of the E-Grant storefront, is unlikely. In addition, no company supporting this proposal had an existing COTS product. Rather the proposal was to build the solution. Building the solution would probably extend the timeframe for deploying the unified application mechanism, as well as add additional complexity. Therefore, it has been determined that cost sharing is not a viable option for this project.

Authentication – The E-Grants project team will work closely with the E-Authentication team to ensure that E-Grants solutions are compatible and compliant with overall E-Gov requirements and capabilities. The E-Grants systems may use initially an enhanced system of usernames and passwords as the initial user authentication mechanism. However, it is planned that the E-Grants initiative will eventually leverage other Federal projects to provide an electronic signature mechanism.

E-Grants IT Architecture – E-Grants solutions must be in line with the E-Grants IT Architecture proposed in the E-Grants Business Case. Excerpts from the E-Grants Business Case can be found in an appendix to this report. The key objectives of the E-Grants Web Architecture are:

- Scalability & performance
- Ease of development and maintenance
- Future extensibility

Key IT Assumptions

Assumption	Strategy
E-Grants storefront must be able to integrate with Federal agencies at various levels of technical capability.	Support commonly available standards and tools (e.g., Web Services, XML) and provide alternate interfaces where necessary.
E-Grants storefront must serve the needs of a diverse grantee community (e.g., state & local governments, universities, small-businesses).	Provide multiple grantee interfaces to support the needs and capabilities of different grantees. This will include a web-based person-to-system interface as well as one or more system-to-system interfaces
The system must be adaptable, scalable, and maintainable.	Standards-based COTS and open-source products will be used to the maximum extent possible.
Security and privacy issues are critical to the success of the E-Grants storefront.	Security will be designed from the start and will be continue to be addressed throughout the entire system lifecycle.

NEXT STEPS

The next phase of this evaluation will include demonstration and evaluation of the identified systems and COTS products followed with recommendations, and a cost-benefit analysis.

Identification of products and contract vehicles for E-grants need to be in place no less than twelve months before deployment.

VI. Appendices

A SURVEY RESULTS

Commercial Products and Services

45 surveys returned of the 75 surveys sent

#	Functional Definition	YES	NO	N/A or blank
F1.1	The product is web-based for all functionality.	84%	7%	9%
F1.2	The product allows users to re-use data via Windows copy/paste functionality and/or template selection.	91%	0%	9%
F1.3	The product allows off-site or remote access to the application for users who are not working in an Agency facility.	89%	2%	9%
F1.4	Authorized users can view the status of their application by grant / cooperative agreement and program.	91%	2%	7%
F1.5	Authorized users can view the history of all system and user actions by grant / cooperative agreement and program.	84%	7%	9%
F1.6	The product supports pre-defined searches.	87%	4%	9%
F1.7	User-definable fields and drop down values are configurable by authorized users.	87%	4%	9%
F1.8	The product automatically routes electronic copies or tracks manual routing of paper copies of documents to specified recipients on the user-defined or re-usable distribution lists.	84%	9%	7%
F1.9	The free-form text fields are available to support the entry of document and item -specific notes or comments.	87%	4%	9%
F1.10	The product provides a searchable database of user-defined text statements that may be searched in data and stored documents.	82%	9%	9%
F1.11	The product will not allow user to proceed until all mandatory fields are complete.	91%	0%	9%
F1.12	The user may save incomplete work to be retrieved at a later date.	91%	2%	7%
F1.13	The product validates that the data entered in specific fields conforms with a set format before allowing the user to proceed to the next field.	91%	2%	7%
F1.14	Authorized users have the ability to assign/reassign responsibility.	78%	7%	15%
F2.1	The product provides user-defined, unique, sequential, automatic document numbering as specified by agency and document type.	82%	9%	9%
F2.2	The product provides various document numbering formats.	73%	18%	9%
F2.3	The product allows reconstructed documents (i.e., documents that existed prior to implementation) to maintain original number when entered into the system.	82%	9%	9%
F2.4	The product allows manual numbering of documents by authorized users for crosswalk purposes.	71%	18%	11%
F3.1	The product provides pre-defined workflow processes including document routing, review/approval and notification.	84%	9%	7%
F3.2	The product allows modification of workflow processes by authorized users.	78%	13%	9%
F3.3	The product maintains an audit trail of all user activity.	89%	7%	4%
F3.4	The system electronically routes documents for multiple reviews and/or concurrent reviews as required.	80%	9%	11%
F3.5	The product requires the user to note any user-defined deviations.	53%	29%	18%

F3.6	The product allows the creation and maintenance of multiple pre-defined public and private routing lists by authorized users.	76%	18%	6%
F3.7	The product prevents the execution or release of a document before all reviewers have approved it.	84%	9%	7%
F3.8	A system administrator can maintain user access and authority. This includes the types of documents they can approve and their approval thresholds.	87%	9%	4%
F3.9	The product supports time for specific workflow events.	80%	16%	4%
F3.10	The product automatically notifies appropriate users of significant events such as receipt of items for approval, deadline ticklers, etc.	82%	9%	9%
F3.11	The alerts will be issued to managers for significant or expired events.	80%	11%	9%
F3.12	The product has the ability to generate user notification outside the system via standard email software as needed.	87%	4%	9%
F3.13	The product provides the capability to automatically assign responsibility based on rules defined by authorized users.	78%	11%	11%
F3.14	The product allows an unlimited number of workflow plan templates (i.e., groups of workflow events) to be created for use.	78%	16%	6%
F3.15	The product will allow reassignment of responsibility as required by authorized users.	87%	7%	6%
F3.16	The product provides electronic signature capability.	64%	24%	12%
F3.17	The product provides workflow configuration by authorized users.	78%	16%	6%
F3.18	Distribution lists can be defined by user, by agency, by grant type, etc.	71%	13%	16%
F3.19	The product automatically distributes document electronically after execution/release based on user-defined factors such as dollar value, accounting code, office, program, grantee, etc.	71%	22%	7%
F3.20	The product provides an option that can be activated to route work automatically to an alternate user in the absence of a user.	69%	22%	8%
F3.21	The product automatically tracks relationships between documents and document history.	76%	11%	13%
F3.22	The product provides built-in access levels, workgroup designations and organizational/office levels to maintain data integrity and eliminate the need to limit document access to one user at a time.	89%	4%	13%
F3.23	The product limits access of a password to authorized approvers only.	87%	4%	9%
F3.24	The product can allow for default values for commonly used codes (e.g., addresses, accounting codes) by user.	80%	7%	13%
F3.25	The product prohibits unauthorized changes to actions/documents including electronic supporting documentation and attachments.	87%	7%	7%
F3.26	'Read Only" access to an approved or executed/released document can only be accomplished by the system administrator or other authorized user.	82%	7%	11%
F3.27	The system administrator or other authorized users have the ability to create, maintain and assign security group profile access rights based on position description, warrant, organization and other relevant factors.	82%	9%	9%
F3.28	The System Administrator or other authorized users have the ability to create, maintain and assign access rights at menu and functional levels.	87%	7%	7%
F3.29	The System Administrator or other authorized users have the ability to create, maintain and assign access rights at field level.	58%	33%	9%
F4.1	The product provides the capability to create and edit grant announcement packages	73%	20%	7%
F4.2	The product provides the ability to delete or put on hold solicitation packages not ready for release.	73%	18%	9%

F4.3	The product provides the capability to copy previously created package materials including some or all documents.	76%	16%	8%
F4.4	The product provides the ability to amend / modify package prior to release and after release with the ability to track all changes and hold the original document version.	78%	13%	8%
F4.5	The product provides the establishment and use of default data by user.	84%	7%	9%
F4.6	The product provides the capability to post solicitation online at agency website and via E-Grants Storefront.	71%	22%	7%
F4.7	The product supports attachment of various types of documents within the solicitation package.	89%	4%	7%
F4.8	The product allows solicitations and attachments to be sent electronically.	84%	9%	7%
F4.9	The product provides online review of proposal, grant /cooperative agreement, programs and attachments.	80%	11%	9%
F4.10	The product allows user to build and save text selection matrices for reference and re-use.	71%	16%	13%
F4.11	The product provides the ability to create/maintain solicitation mail and email lists that include selected users contained in the grants database.	67%	27%	7%
F4.12	The product provides checklists of required attachments and supporting documents by document type to assist the user in each phase of the process.	73%	20%	7%
F5.1	The product provides the capability to receive online applications data entered on the E-Grants Storefront website or agency sites.	69%	22%	9%
F5.2	The product provides the capability to automatically and manually screen and accept or reject applications based on specifically defined criteria.	67%	29%	4%
F5.3	The product provides the ability to receive and process user attachments.	80%	9%	11%
F5.4	The product automatically notifies grantee of electronic proposal receipt.	76%	13%	11%
F5.5	The product provides the ability to reference paper documents that supplement the application or proposal.	78%	13%	9%
F5.6	The product provides the ability to scan paper documents and link to application or proposal.	71%	22%	7%
F5.7	The product automatically generates paper or electronic denials.	71%	22%	7%
F5.8	The product associates application or proposal with the originating grant or grantee file.	87%	7%	7%
F5.9	The product provides the ability to generate an abstract of the proposal.	62%	31%	7%
F5.10	The product provides notification to the award winner, once an award is chosen.	73%	20%	7%
F6.1	The product supports tracking and status of protests, disputes and appeals.	56%	40%	4%
F6.2	The product allows authorized users to issue financial obligations by means of an interface with financial systems and Federal Payment Management Systems for incremental periods, within a one or two year period.	66%	30%	4%
F6.3	The product supports workflow functionality for award / modification processing.	78%	16%	6%
F7.1	The product provides the ability to track grantee program and financial performance per award.	62%	31%	7%
F7.2	The product provides the capability of tracking planned versus actual performance and alerting the user to deviations from previously defined norms. For example, financial reports provide actual spending data that when compared to planned obligations indicate over or under spending, flagging deviations.	60%	29%	11%
F7.3	The product automatically updates information contained on forms/documents whenever an action is changed.	76%	16%	8%
F8.1	The product provides the ability to suspend and reactivate awards/grants.	64%	24%	12%
F8.2	The product provides the ability to compare detailed government estimate and grantee's budget with actual final cost.	60%	36%	4%

F8.3	The product notifies the responsible user when a grant is going to expire within a user-specified time frame.	58%	36%	6%
F9.1	The product allows closing audit of grant activities.	60%	31%	9%
F9.2	The product designates status of grant as closed.	71%	22%	7%
F10.1	The product support use of Windows cut-and-paste clipboard.	89%	0%	11%
F10.2	The product has the capability to output a document in a non-alterable electronic format.	82%	11%	7%
F10.3	The product permits users to check supporting documents/ attachments in and out; only one authorized user may select a document for checkout in read/write mode at a time; and an audit trail of all document changes is maintained by the system.	64%	27%	9%
F10.4	The product supports the ability to associate an unlimited number of electronic supporting documents and attachment with system-generated documents (e.g., solicitations).	82%	9%	9%
F10.5	The product supports different document file types (word processing, spreadsheet, etc.).	84%	7%	9%
F10.6	The product prevents editing of supporting documents at a certain point.	80%	13%	7%
F10.7	The product supports automatically pre-filling of selected data contained on forms/documents.	84%	7%	9%
10.8	The product easily accommodates the addition of new forms/documents as prescribed for use by the regulatory authorities and the Agency.	78%	9%	13%
F11.1	The product is JFMIP compliant. http://www.jfmip.gov/jfmip/download/systemreqs/grants.pdf	47%	36%	18%
F11.2	The product accommodates the data dictionary found at website: http://www.financenet.gov/financenet/fed/iaegc/develop.htm	64%	27%	9%
F12.1	The product allows users to lock or unlock the calculation of projected dates when maintaining milestone plans.	60%	33%	7%
F12.2	The product supports milestones associated with specific actions.	67%	24%	9%
F12.3	The product automatically recalculates dependent projected completion dates upon entry of an actual completion date.	47%	44%	9%
F12.4	The product permits projected completion dates to be changed using calculations based on calendar or user-defined workdays.	51%	40%	9%
F12.5	The product supports automatic notification of missed or late milestones.	69%	20%	11%
F12.6	The product supports generation of an upcoming milestone report.	64%	24%	11%
F12.7	The product supports generation of a missed milestone report.	64%	24%	11%
F12.8	The product supports authorized users to review the volume of pending and assigned items as well as the status of actions or milestones associated with assignments.	78%	11%	11%
F12.9	The product alerts users of late/ pending deliverables.	73%	16%	11%
F13.1	The product supports data archival processes and selected closed-out awards including all related supporting documents and attachments.	78%	16%	7%
F13.2	The product supports archiving documents/records that may be retrieved for viewing/printing at any time directly from the archived database (including forms and supporting documentation/ attachments) per user-defined criteria.	71%	20%	9%
F13.3	The product supports the capability to switch to the archive database without leaving the production system to view archived records as easily as active records.	69%	24%	7%
F13.4	The product supports generation of standard or ad-hoc reports from data in the archive database.	71%	20%	9%
F13.5	The product supports creation, maintenance and use of multiple archive databases if desired.	73%	20%	7%
F13.6	The product supports archival by user-defined parameters.	64%	29%	7%
F13.7	The product supports a complete search capability within the archive database.	67%	27%	7%
F14.1	The product supports tracking of accounting data from submission through award.	67%	27%	7%

F14.2	The product generates and tracks obligations.	60%	36%	4%
F14.3	The product generates and tracks commitments.	62%	33%	4%
F14.4	The product generates and tracks commitment reversals.	60%	36%	4%
F14.5	The product generates and tracks de-obligations.	53%	40%	7%
F14.6	The product validates accounting data against data table(s) imported from the financial system.	53%	42%	4%
F14.7	The product establishes a point of commitment (e.g., document execution).	56%	38%	7%
F14.8	The product establishes point of obligation (e.g., document execution).	58%	38%	4%
F14.9	The product disallows obligations with no corresponding commitment if desired.	56%	40%	4%
F14.10	The product calculates and tracks unspent dollars remaining on award (i.e., committed amount less the obligated amount.)	58%	38%	4%
F14.11	The product can distribute costs to accounting codes at line item level or header level by dollars, quantity or percent.	60%	36%	4%
F14.12	The product automatically calculates and tracks committed/de-committed amounts/dollars.	58%	38%	4%
F14.13	The product automatically calculates and tracks obligated/de-obligated dollars and amounts.	58%	38%	4%
F14.14	The product reconciles obligated dollars/amounts against committed dollars/amounts.	53%	42%	4%
F14.15	The product automatically recalculates committed/obligated dollars when affected by an amendment or modification.	56%	40%	4%
F14.16	The product supports assignment of multiple accounting codes for fund distribution.	62%	31%	7%
F14.17	The product allows for the distribution of funds to accounting codes by percentage or dollars.	67%	29%	4%
F15.1	The product allows users to design custom reports/queries using any/all fields within the data dictionary.	82%	9%	9%
F15.2	The product allows creation of ad hoc queries that can be saved for subsequent use.	80%	9%	11%
F15.3	The product provides the ability to generate workload management reports for authorized users.	67%	20%	13%
F15.4	The product allows for the aggregation of data at multiple organizational levels for analysis and reporting.	73%	16%	11%
F15.5	The product provides access to reports based on user security levels.	80%	11%	9%
F15.6	The product allows for the creation of pre-defined reports relating to development of solicitation package, applications, award, modification, management and close out of grants based on data dictionary terms.	73%	13%	13%
F15.7	The product provides reporting at various levels from user, agency, department, etc.	76%	11%	13%
F15.8	The product allows access to reports based on user security levels.	71%	16%	13%
F15.9	The product handles regulatory reporting for required reporting such as FAADS (http://www.census.gov/govs/faads/98bguide.pdf) and any required by OMB (http://www.whitehouse.gov/omb/grants/index.html).	40%	36%	24%
	TECHNICAL DESCRIPTIONS			
	Document Access/Storage and Audit			
#	**Functional Definition**			
T1.1	Audit trail functionality demonstrates the origin of a document and all resulting activity, plans, milestone plans, and invoicing data. Instant access to any document listed.	78%	13%	9%
T1.2	The deletion of system records complies with NARA, Department of Justice and Agency document retention regulations and policies. Record deletion may be manual or automatic based on a set of user-defined parameters.	73%	18%	9%

T1.3	The solution provides an audit capability to record the user ID, time and date of the audit event for successful and unsuccessful logon attempts; changes to role assignments; access to and archiving of any audit trails; and any changes to security settings.	76%	20%	9%
T1.4	The solution maintains an audit log for all changes to stored data.	76%	16%	4%
T1.5	The solution maintains a log for any transaction-level auditing.	76%	18%	9%
T1.6	The solution has the capability of running on an operating system that provides an object reuse restriction.	49%	13%	7%
Data Integrity				38%
T2.1	The product maintains data integrity by preventing damage to or loss of system data.	71%	0%	29%
Security, Data Access and System Administrator Capabilities				
T3.1	The product provides the ability to restrict data access by record level, field level, menu option and tab.	82%	9%	9%
T3.2	The solution provides capability to assign each user a unique user ID and password.	93%	0%	7%
T3.3	Passwords are encrypted for confidentiality.	87%	7%	7%
T3.4	The product expires passwords after a defined time period. Separate expiration periods are permitted by user type (i.e., System Administrator).	76%	18%	7%
T3.5	The product provides the ability for an administrator to control user access.	91%	2%	7%
T3.6	The product maintains a relational database providing an organized collection of data items from which data can be accessed or reassembled in many different ways without having to reorganize the database tables.	82%	7%	11%
T3.7	The product can provide a data model that accommodates Agency specific and E-Grants Storefront data dictionary @ www.financenet.gov/financenet/fed/iaegc/develop.htm	80%	13%	7%
T3.9	Document sharing can be established globally by the system administrator or on a document-by- document basis.	78%	16%	7%
T3.10	The application operates within the Federal Public Key Infrastructure (PKI) X.509 V3 or SSL protocol with minimum 128 Bit Encryption and 3DES.	80%	13%	7%
T3.11	The solution is capable of providing 128 bit secure socket layer (SSL) version 3.0 encryption between the host and client.	89%	0%	11%
T3.12	The solution is Public Key Infrastructure (PKI) compatible with ANSI X.509 v3 standards and NIST Special Publication 800-25, NARA's Guidance for Agencies implementing Electronic Signature Technologies.	76%	16%	9%
T3.13	The product will ensure that Passwords are different from User ID’s.	78%	18%	4%
T3.14	The password characteristics (e.g., length, character types, etc.) are defined by the System Administrator or other authorized users.	78%	18%	4%
T3.15	The product requires users to change password after initial login.	69%	27%	4%
T3.16	The solution provides the capability to ensure that passwords are at least eight alphanumeric characters.	89%	4%	7%
T3.17	The product provides the system administrator with the ability to disable/enable user access by User ID.	89%	4%	7%
T3.18	The product provides the capability to lock User ID’s after a specific number of invalid login attempts.	80%	13%	7%
T3.19	The product provides the capability to disable a user after 90 days of inactivity.	73%	20%	7%
T3.20	The product provides a password history capability (e.g. that expired passwords are not reusable after a specified period of time).	67%	29%	4%
T3.21	The product requires the system administrator to unlock the user ID after a specified number of invalid logon attempts.	76%	20%	4%

T3.22	The product requires the system administrator to replace forgotten passwords instead of reissuing the old password.	76%	20%	4%
T3.23	The product requires users to change the replaced password immediately upon logging into the system.	71%	22%	7%
T3.24	The product provides the capability to lock or delete any default guest or administrator accounts and allows the passwords on these accounts to be changed.	84%	7%	9%
T3.25	The product encrypts passwords during transmission and if stored on the user's desktop.	78%	16%	7%
T3.26	The product provides the capability to lock the application after a system-configurable period of non-use.	76%	18%	7%
T3.27	The product provides capability to encrypt all information during transmission.	80%	9%	11%
T3.28	The product has the capability of running on an operating system that provides an object reuse restriction.	67%	7%	27%
T3.29	The product is capable of operating in a DES3 Virtual Private Network (VPN) tunnel.	84%	4%	11%
T3.30	The product prevents damage of system data from such events as operator errors, simultaneous changes, or system failures.	89%	9%	2%
T3.31	In the event of a system failure, the product provides the capability to automatically back out all incomplete transactions, restore the system to its last consistent state, and reapply transactions that have not been successfully posted since the last back up.	84%	11%	4%
T3.32	The product limits end-user access by accounting classification code structure by various modes including 1) read-only access, 2) read and input access, 3) read and approval authorization, and 4) read, input, and approval authorization.	80%	13%	7%
T3.33	The product supports an unlimited number of concurrent users.	71%	4%	24%
	Graphical User Interface			
T4.1	The product utilizes standard Windows/Web navigation.	93%	0%	7%
T4.2	The product provides consistency in commands, dialog windows, data structures, and information presentation between web pages and integrated systems.	87%	4%	9%
T4.3	The product provides context-sensitive on-line help.	78%	11%	11%
T4.4	The product provides button "tool tips" that describe the function of buttons.	80%	11%	9%
T4.5	The product employs error-handling routines with messages that report processing errors to users.	89%	7%	4%
T4.6	The product indicates when processes are being executed and provides completion notifications when running reports.	69%	2%	29%
	Workstation Configurations			
T5.1	The minimum systems requirements for running the application in the following environments are NT, 95,98. Include the RAM, Disk Space and CPU.	58%	0%	42%
	Database Management			
T6.1	The product supports Oracle version 8.X, Oracle8i, Oracle9i, SQL Server 7.0 and SQL Server 2000.	87%	4%	9%
T6.2	The product support access to LDAP, OLE DB and Open Database Connectivity (ODBC) data sources.	93%	0%	7%
T6.3	The product allows authorized personnel to add, change, or delete records in the database.	91%	0%	9%
T6.5	The product provides authorized users with ability to query the audit log by type of event, event date, user identification, or any other field or combination of fields used in the audit log.	84%	9%	7%
T6.6	The product is capable of supporting secure administration access including but not limited to SecureID.	60%	11%	29%

	Email			
T7.1	The product utilizes standardized Simple Mail Transport Protocol (SMTP) for inter-Center e-mail transport and x.400 protocol.	87%	4%	9%
T7.2	The product supports the use of multiple SMTP email systems (e.g., Microsoft Exchange, Microsoft Outlook and Send Mail) simultaneously.	84%	7%	9%
T7.3	The product support client distributed X.500-based Directory Service via Lightweight Directory Access Protocol (LDAP) for functionality such as messaging and workflow.	44%	29%	27%
	Web Server			
T8.1	The product interfaces to Microsoft Information Internet Server 4.X or higher	62%	13%	24%
	Browsers			
T9.1	Additional software, plug – ins or utilization of Java applets may be necessary to add to the user desktop in order to utilize standard browser (Microsoft Internet Explorer, Netscape, etc.).	67%	27%	7%
T9.2	The technical architecture of the product is web-based for all system components.	87%	7%	7%
T9.3	Cookies are not utilized (except for session management).	71%	2%	27%
	COTS Maintenance			
T10.1	The product support, version control of system components and seamless integration of application changes is managed.	89%	2%	9%
T10.2	The product supports modular upgrades of application components.	91%	0%	9%
T10.3	System patches and version updates are made for new product releases.	87%	2%	11%
T10.4	The responses to technical assistance requests can be provided within 4 hours of the time the request was made. Items that cannot be resolved immediately are escalated to the appropriate organization for disposition as follows: Product Issues – COTS vendor; Product Technical Support – COTS Vendor; Business process issues – COTS program management office; Connectivity – COTS user information technology support	80%	2%	18%
T10.5	The attributes of the product's knowledge database are available through the internet.	51%	18%	31%
	Interfaces			
T11.1	The product supports batch interface with legacy systems for the export/import of data to/from accounting, document management and other systems as required.	82%	9%	9%
T11.2	The product supports batch interfaces with Agency accounting system for the inbound transfer of accounting code data and the outbound transfer of obligation, commitment and other required data.	78%	13%	9%
T11.3	The product passes the grantee's TIN number to other applications with other applicable grantee data.	84%	11%	4%
T11.4	Data extractions and export/imports can be accomplished as an event or can be scheduled to run at a specific time or time interval.	80%	11%	9%
T11.5	The product provides all accounting transactions, the TIN and EIN for updates to other systems.	64%	27%	9%
T11.6	The product provides the ability to conduct a daily reconciliation with other systems.	56%	38%	7%
T11.7	The product provides an electronic interface to FedBizOpps, E-Grants Storefront or other government designated system for the posting of grants information, amendments, award notices, etc. Providing the functionality described in the E-Grants Storefront Architecture Plan.	67%	24%	9%
T11.8	The product support use of Microsoft and Corel Office products (e.g., MS Word, Excel, WordPerfect).	84%	7%	9%
T11.9	The product provides electronic access to HHS Central Contractor Registration (CCR) System if required.	56%	38%	7%
T11.10	The product interfaces with the HHS System for the transfer, look-up, payment information and payment.	60%	36%	4%

T11.11	The product supports multiple accounting code structures.	64%	27%	9%
T11.12	The product provides some validation and cross-validation of accounting codes to ensure the selection of correct, compatible accounting strings.	67%	27%	7%
T11.13	The product can update other applications with new grantee addresses.	82%	9%	9%
T11.14	The product utilizes XML.	67%	7%	27%
	Data Conversion			
T12.1	The product supports the conversion of existing grantee data for use.	60%	9%	31%
	PRODUCT			
#	**General Product Overview**			
P1.1	Describe your eGrants COTS product, special features, and what you feel sets your product apart from other COTS eGrants solutions.			
P1.2	Submit 6 sets of any brochures, system manuals, training manuals, product materials, and any other materials that validate and/or enhance your response to this document.			
P1.3	Provide a copy of the GSA schedule and any other government schedule that your eGrants COTS product is on.			
P1.4	Provide a list of Federal and non-Federal organizations that currently utilizes the COTS product and a brief description of how it is being utilized.			

Federal technology solutions

System Name	Federal Agency(s)	Expansion or Benchmarking	Comments	Currently Operating	Functions / Processes	Types of Grants	Technologies Used
HUD Program Inventory (HPI)	Department of Housing & Urban Development (HUD)	Yes both		Yes	Good for search and find capabilities	Mandatory & Discretionary	Cold Fusion Version 4.5; Netscape 4.7 or above; Internet Explorer; E-mail functionality; MS Word; automated approval tracking & processing
Departmental Grants Management System (DGMS)	HUD	Yes both	No significant development/mods needed for expansion; system is table driven; supports organization profiles; based on SF 424 but enhanced; ties reporting data to program performance; may require additional servers (for load balancing & backup) and routers; will need link to FR or to CFDA; need to add topics for agency project types; need to add agency-specific program listings.	Yes	End-to-End of Lifecycle -- Including accommodations for 5-year plans and annual action plans.	Mandatory & Discretionary	Netscape or Microsoft Internet Explorer 4.0 (or later). Browser must support HTML Version 2.0 (or higher) and JAVA Applets; 2 Sun E450 front-end Servers; Sun E6500 database Server;
Interagency Discretionary Grant Application Project	National Aeronautics and Space Administration (NASA) in conjunction with NIH, NSF, ONR, NOAA, CREES	Yes both		Yes	Create & submit application	Target user group - research-based grantees	Netscape 3.0 (or above); Microsoft Internet Explorer 4.0; JAVA 2 Enterprise Edition (J2EE) framework; XML; Hypertext Transfer Protocol (HTTP) and Simple Object Access Protocol (SOAP); IMAP
On-Line Data Collection / Grants Administration Tracking & evaluation System (GATES)	Department of Health & Human Services (HHS) / Administration for Children & Families (ACF)	Both for On-line Data Collection	On-Line Data Collection system only for reporting purposes - Dynamic Forms concept offers data-base driven solution for forms. GATES is only a model for tracking grant reporting data & tying performance results to objectives.	GATES is operating. On-line Data Collection is in prototype.	Reporting (fiscal, program performance and mandatory grant reports; tracking reporting data and tying performance to objectives.	Mandatory & Discretionary	

System Name	Federal Agency(s)	Expansion or Benchmarking	Comments	Currently Operating	Functions / Processes	Types of Grants	Technologies Used
Grant Administration & Payment System (GAPS)/ E-Application – part of Ed's E-Grants database.	Department of Education	Yes both	Currently does not support org. pro-files as discussed for E-Grants initiative; need e-signature functionality; interface to provide grant application data to other agencies' mgmt. systems; need to modify web-based admin. function to publish grant app. packages to website.	Yes	End-to-End of Lifecycle -- GAPS/E-Grants is end-to-end; E-Application - Establish competition; develop & submit application	Mandatory & Discretionary	Oracle Version 8i; Standard SQL used for queries that are changed frequently or are less complex. DEC UNIX on DEC Alpha Server; EDI; PERL; Windows NT; Visual Basic 6.0; XML cached data to retrieve info. Updated hourly or daily; 3-node NT server cluster running Microsoft Internet Information Server.
E-Grants	Department of Commerce	Yes both	MBDA Portal features single sign-on; creation of personal profiles & pre-populated forms; grants performance module would require redesign; currently no integration with financial disbursement process. System and Portal run on open-source software	Yes	Apply; review applications; monitor grantee performance		MySQL data-bases; Red Hat Linux/Apache web server; PHP coding;
Fiscal Management Information System (FMIS)	Department of Transportation (DOT) - Federal Highway Administration	benchmarking	E-signature; data passed directly to General Ledger accts; Real-time responses; permits interfacing; same-day electronic funds transfers; On-Line claim validations; reporting capability; auto updating to project files.	Yes	Recording projects	Block grants; state and lo-cal governments	
Port Security Grants System	DOT - U.S. Maritime Administration	Yes both	Scalability unlimited; would require additional development effort to expand government-wide	Yes	Application submission & evaluation/re-view processes	Discretionary	Microsoft SQL database; Internet Explorer version 5.5; MS FrontPage web page tool; Visual basic; active server pages.

System Name	Federal Agency(s)	Expansion or Benchmarking	Comments	Currently Operating	Functions / Processes	Types of Grants	Technologies Used
DOT Grants Information - Intermodal Transportation Database	DOT- Bureau of Transportation Statistics	Yes both	Provides geographic info regarding location of approved grants in both map & text report formats. Provides geographic info regarding location of approved grants in both map & text report formats.	Yes	Inquires for grant statistical info by state, county and Cong. District		Internet mapping solution
Transportation Electronic Award Management (TEAM-Web)	DOT - Federal Transit Administration	Yes both	Need to change page layouts; Modify Database Communication Components to accommodate agencies' historical data, database management systems and database designs; modify workflow and review criteria to meet agencies' processes	Yes	End-to-End of Lifecycle -- Application submission; Application review and award; project management; budgetary account mgmt. & reconciliation	Mandatory & Discretionary	Microsoft standard web development technology: ASP, HTML, XML, COM, and VP Script upon Computer Assoc. Ingres Relational Database; CA Ingres II DBMS, CA Ingres Replicator, CA OpenROAD and CA ArcServ.
FAA E-Grant System	DOT - Federal Aviation Administration	Yes both		Yes	Pre-proposals and final proposals posted (via Adobe); panel reviews on line for results not captured in database; grantee reports not in database	Currently accommodates research grants; respondent notes that all types of grants/contracts may be accommodated	2 MacIntosh OS Servers; one dedicated DSL Line;

System Name	Federal Agency(s) Submitting the Information	Expansion or Benchmarking	Comments	Currently Operating	End-to-End of Lifecycle	Research grants	
NSF FastLane	National Science Foundation	benchmarking	Significant effort to modify to all agencies as it is tied to NSF business processes and NSF database; not web-based or 508 compliant; specific NSF FastLane practices that can be modeled include file upload support, delegation of passwords and permissions, organizational registration and profiles, password and permission-based electronic signatures; proposal deadline management. NOTE: NSF is partnering with NASA, NIH, ONR, Ag/CSREES, and NOAA - see NASA submission.	Yes	End-to-End of Lifecycle -- Proposal prep. & submission; proposal review; panel review; interactive electronic panel mtgs; status inquiry; release of reviews; project reporting; post award notifications and requests; cash requests; financial reporting; award search; electronic signatures	OPHS discretionary, service, training, demonstration and research grants and cooperative agreements.	JAVA Servlets; UNIX Solaris environment; SSL; Intel Accelerator; uploaded docs are converted to PDF Schizo from MIRA Digital Publishing - checked by PitStop from Enfocus; PDFs stored on a UNIX file server.
Office of Public Health and Science E-Grants System	HHS - Office of Public Health & Science	benchmarking		Yes	End-to-End of Lifecycle -- Accept adobe acrobat file or convert OLE-compliant files (Object-linking and embedding) to Adobe; uses electronic application kits;	OPHS discretionary, service, training, demonstration and research grants and cooperative agreements.	User interface is HTML v4.0 with JavaScript; uses centralized server approach; Java 2 Enterprise Edition;
White paper on web integration products	HHS / ACF	benchmarking		Not applicable	In addition to the surveys submitted by government agencies, the HHS Administration for Children and Families submitted a white paper on web integration products.		

B BUSINESS CASE REFERENCES

E-grants Vision, Goals and Objectives

E-grants Vision

The E-Grants project will:

- Produce a simple, unified "storefront" for all customers of Federal grants to electronically find opportunities, apply, and manage grants.
- Facilitate the quality, coordination, effectiveness, and efficiency of operations for grant makers and grant recipients.

E-Grants Goals

Four goals for the E-Grants initiative were defined by consensus among the grant-making agencies:

(1) Eliminate the burden of redundant or disparate electronic and paper-based data collection requirements.

(2) Define and implement simplified standard processes and standard data definitions for Federal grant customer interactions.

(3) Protect the confidentiality, availability, and integrity of data.

(4) Standardize the collection of financial and progress report data in support of audit and performance measurement activities.

E-Grants Objectives and Timetable

Six major objectives for the E-Grants initiative were defined by consensus among the grant-making agencies, along with the dates for completion of those objectives:

(1) Finalize the E-Grants Business Case in support of partner requirements and other participant input. Include defined categories of grants, solution concepts of simplified processes, solution concepts for standardized data, concept for achieving the goals, Program Management plan, organizational structure. (4/15/02)

(2) Pilot a simple, unified way to find Federal grant opportunities via the Web. Include standardized format and data elements. (7/1/02)

(3) Evaluate the use or expansion of interagency and agency specific capabilities for discretionary grant programs. Including COTS packages. (6/1/02)

(4) Work with E-Authentication PMO and privacy groups (ongoing)

(5) Define application data standards (10/1/02)

(6) Deploy simple, unified application mechanism (10/1/03)

IT Architecture Overview

E-GRANTS

IT ARCHITECTURE SUMMARY

The E-Grants IT architecture will:

- Be compatible and compliant with the standards documented by the E-Gov Architecture initiative and with overall Federal IT standards and architecture.
- Support the Federal Enterprise Architecture Framework (FEAF) as the framework for the system architecture.
- Use XML as the data representation format.
- Be scalable for future horizontal and vertical growth of the E- system with segments into logical and physical modules.
- Provide secured access with high availability using a duplexed enterprise server environment to store the data and interface with the Web application server.
- Interface its Web application server Policy, Directory, and Messaging servers.
- Use storage area networks (SANs) to store and backup the data.
- Use load balancing to manage processing.
- Use an enterprise database that has the capacity to expand either in a centralized environment or in a distributed environment.
- Need to process approximately 500,000 grant applications.

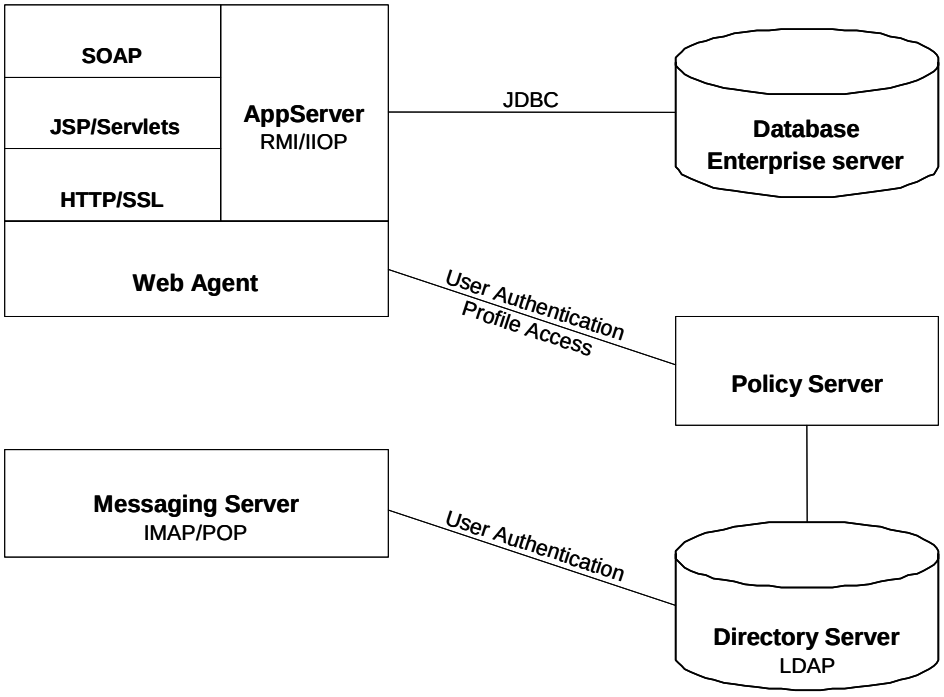


Figure I-1: Server Architecture

The Web Architecture for the E-grants storefront will

- Use the J2EE framework and architecture as depicted below.

- Use loosely coupled layers to simplify development and maintenance by reducing complexity.
- Use a modular combination of JavaBeans (Model), JSP (View), and Servlets (Controller) to implement the presentation layer and upper business logic layer.
- Use a combination of EJB Session Beans and ordinary Java classes used to implement the business services layer. The use of EJB provides a number of major benefits including integrated security model, transaction support, and scalability.
- Use a data object layer (DOL) to encapsulate the database interface.
- Minimize use of EJB Entity Beans to avoid performance problems.
- Consider emerging standards such as Java Data Objects (JDO) to help encapsulate and simplify database access in the future.
- Use layers to help reduce the coupling between code and ease maintenance. A controller (written as a Java Servlet) will be used to encapsulate global control logic such as access control and error handling. Business logic is implemented using a combination of EJB Session Beans and Java classes.
- Encapsulate all database access as a layer of Java classes that use JDBC to interact with the database server.
- Use EJB Entity Beans in limited cases where performance issues can be minimized or eliminated.
- Use JSP pages and JavaBeans as the primary mechanism to code the HTML user interface and interact with the business logic layer.

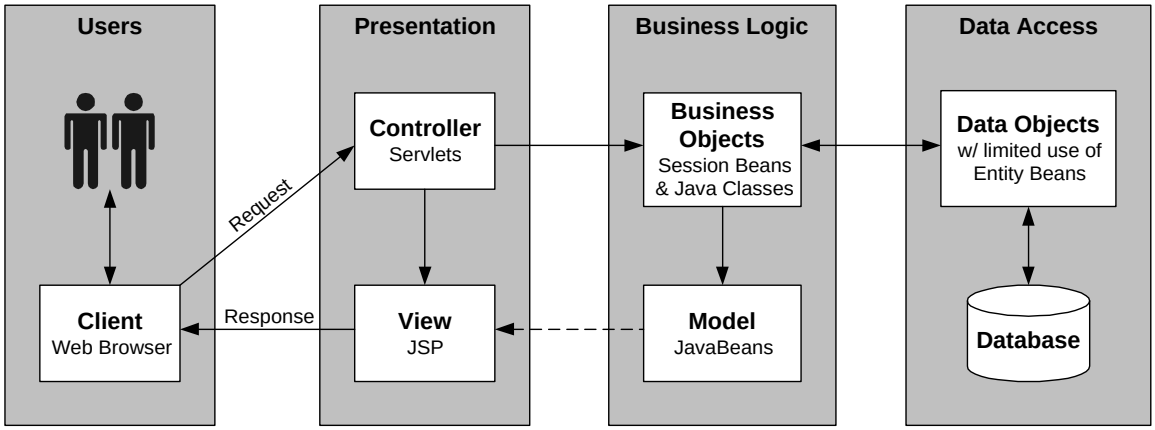


Figure I-2 – Recommended J2EE Architecture

Integration Strategy is based on the evaluation of communication protocols and the E-Grants Storefront requirements, the integration strategy will use:

- SOAP as the protocol for synchronous communication with agencies.
- IMAP/POP to asynchronously deliver files (grant applications and reports) to smaller agencies.
- Avoid proprietary products and protocols that require agency investment or buy-in.
- Simplify agency integration by providing two tiers of services.

- Provide an application status proxy service for smaller agencies that cannot support real-time status queries.
- Focus on standards now and plan migration to COTS products as the market matures.
- Provide two tiers of services to allow easier integration with smaller agencies that cannot support or afford a sophisticated grants management system and real-time application status module. The approach to support these agencies is to allow easy retrieval of grant applications and reports via low-cost COTS software (e.g., e-mail client) and to simplify application status checking by providing a "proxy server" which smaller agencies can update on a periodic basis. A SOAP-based interface can be defined so that agencies can develop automated tools to upload their internal status data to the proxy server.

Process	Small Agencies	Large Agencies
Grant Applications	Asynchronous retrieval via IMAP/POP	Retrieval via SOAP (or IMAP)
Status Checking	Send periodic updates via SOAP	Synchronous query via SOAP
Reporting	Asynchronous retrieval via IMAP/POP	Retrieval via SOAP (or IMAP)

Table I- 1 – Two-Tier Integration Approach

The precise integration architecture and guidelines will be further defined in the Federal Enterprise Architecture guidelines documents.

IT Modernization and Architecture

Technical Standards

Standards will adhere to the following policy mandates where appropriate:

- Government Information Security Reform Act
- Critical Infrastructure Protection (Presidential Decision Directive 63)
- OMB Circular A-130
- OMB Circular A-127 Section 508, Rehabilitation Act of 1973

Software development will adhere to and be compliant with:

- ISO 9000
- FIPS
- JFMIP

Emerging interoperability standards such as Electronic Data Interchange (EDI), Mark-up Language (XML), and Universal Discovery Description and Integration (UDDI)

Key IT Standards

Standard	Compliance / Usage
Data Communication Services	
Extensible Markup Language (XML)	Standard format for data representation and exchange.

Simple Object Access Protocol (SOAP)	Web services integration with external systems (e.g., Federal agencies).
Internet Inter-ORB Protocol (IIOP)	Integration with back-end systems and services.
ANSI X12 EDI	Integration with large customers and pre-existing systems.
Internet Message Access Protocol and Post Office Protocol (IMAP / POP)	E-Mail delivery of XML grant applications and reports to agencies.
Multipurpose Internet Mail Extensions (MIME)	Standard encoding for document delivery via e-mail.
Data Management Services	
Lightweight Directory Access Protocol (LDAP)	Retrieve and update data stored in hierarchical directories.
SQL 92	Retrieve and update data stored in relational databases.
Java Database Connectivity (JDBC)	Programming API for database access from Java.
ODBC	Programming API for database access.
Programming Languages	
Java 2 Enterprise Edition (J2EE)	Platform independent and widely available framework for the development of web-based and e-business systems.
User Interface Services	
Hypertext Markup Language (HTML)	Thin-client (i.e. web browser) user interfaces.
Dynamic HTML (DHTML)	
Security Services	
Transport Layer Security (SSL/TLS)	Data encryption and security over internet protocols (e.g., HTTP, SOAP, IMAP)
X.509 Digital Signature Certificate	
Virtual Private Network (VPN)	Data encryption and security between back-end systems and key partners.
Network Services	
TCP/IP (IETF STD 5 & 7)	
Simple Network Management Protocol (SNMP)	

Security and Privacy

Security and privacy divided into two main categories (1) protecting the E-Grants servers from unauthorized access or malicious attacks; and (2) protecting the privacy and integrity of data transmitted between the grantee community and the E-Grants storefront, and between the E-Grants systems and Federal agencies. A coherent, comprehensive, and integrated security policy and framework is required to develop effective security

controls. The following assumptions and guidelines will be taken into account while developing the E-Grants systems:

- Security controls should be consistent with the medium to large procurement scenario from the CIO Council recommendations document.
- Transaction security should be based on industry supported security standards and protocols (e.g., SSL/TLS, S/MIME).
- The E-Grants systems should be prepared to use appropriate security mechanisms including user id and passwords, and public-key infrastructure (PKI) for authentication and non-repudiation, where appropriate.
- A prudent, risk-based approach will be used to define security policy and controls.
- Privacy issues will be carefully considered related to professional profile information.
- Multiple layers of security controls are necessary to provide adequate security for the system as a whole. Security should be imbedded at the database layer whenever possible.

Additional Security Guidelines / Assumptions

Web-Based User Access Control

- Encrypted connection (HTTP over SSL/TLS) required for all non-public functions.
- Enhanced username/password authentication mechanism.
- Use COTS products to provide centralized security policy and access control.
- Prepare to support certificate based PKI authentication.

Integration with Federal Agencies

- Use 128-bit SSL/TLS with username/password login or mutual certificate-based authentication to ensure delivery to the intended agency.
- Investigate S/MIME for e-mail delivery of documents.
- Use firewall and TCP wrappers to limit connections to known partners.
- Use a VPN if necessary to provide security in special cases.

E-Grants Server Security

- Use a secure hosting environment.
- Conduct frequent security audits.
- Solid perimeter defense (e.g., Firewalls).
- Intrusion detection
- Strong server access control (e.g., SSH).
- Strong database security controls.
- Use VPN for back-end server communication.

XML / EDI Application Submission

- Encrypted connection (SSL/TLS) required for submission of applications via HTTP or other protocols.
- Investigate S/MIME for e-mail delivery of grant applications and reports.
- Use firewall or TCP wrappers to limit connections to known partners.

C BACKGROUND OF GRANTS DATA DICTIONARY

The 194 grants data dictionary contains data element descriptions for grant application data elements with both XML tags and EDI transaction set definitions.

In addition it has descriptions for Common Type Definitions; Address and Contact Elements; Geographic Location Elements; Common Measurement Elements; Common Person Elements; Common Organization Elements; Supporting Information Elements; Education/Degree Elements; Organization and Professional Profile Elements; Indirect Cost Rate Elements; Grant Transaction Elements; Grant Application Elements; Grant Project Elements; Project Budget Elements; Other Support Elements)

A fundamental concept of electronic commerce is the standardization of a common set of terms to be used by trading partners during business communications. The current data elements of a Grants Data Elements Dictionary maintained by the Inter-Agency Electronic Grants Committee (IAEGC) were assembled from analysis of grant application and award forms used by Federal grant making agencies. Also included are data elements from the X12 Implementation Conventions (4010) for Transaction Set 194, Grant or Assistance Application and Transaction Set 850, Purchase Order. Members of the Research and Related Subcommittee and of the State, Local, Non-Profit and Other Subcommittee were instrumental in the analysis, review, and standardization of these data elements.

Background

The IAEGC's Research and Related Subcommittee chartered initial data element collection and database development in 1997. The first increment of the data dictionary focused on the grant application/submission activity of the grant life cycle. The data sources were grant application forms from participating federal agencies that provide grants to colleges, universities, and other research institutions. One example of these forms is the Standard Form 424. A list of data element attributes was prepared to document the information that would be catalogued. Each data element is described by its name, definition, format, and other attributes. Transaction set 194 location and HTML tags were included in early data dictionary design.

During 1998, a series of interviews with granting agencies and data collection activities extended the contents of the data dictionary with additional data elements unique to State, Local, Non-Profit and Other (S&L/NP&O) trading partners. With this expansion, the committee considers that the data dictionary now contains a listing of the data elements used by federal agencies in the grant application process. Attention was then directed toward the addition of award data elements. As before, analysis of various award forms used by granting federal agencies produced a set of data elements used in EDI transaction set 850 and other agency award letters and notifications which have been included in the data dictionary.

As the development of E-grants continues and the grants life cycle is further addressed by E-commerce activities, the data dictionary will grow with status checking, professional and organization profiles, and announcement/solicitation data elements. The long-range goal is to provide trading partners with a single, stable source of information about every data element used in grant processing.

Data Dictionary Description

The grants data dictionary is a database about the electronic grants data elements, not the specific data values belonging to a particular grant, organization or person. The dictionary will maintain information about the things (data entities) that are included in grant data exchanges. A core table contains all data elements names, descriptions and other information independent of grant processing activity.

D GLOSSARY & ABBREVIATIONS

APQC	American Productivity and Quality Center
COTS	commercial-off-the-shelf
CCR	Central contractor Registration *(Department of Defense)*
CREES	Cooperative State Research, Education and Extension Service *(Department of Agriculture)*
DGMS	Departmental Grants Management System *(Department of Housing & Urban Development)*
DOT	Department of Transportation
EIN	Employer Identification Number
FedBizOpps	Federal Business Opportunities announcement system *(General Services Administration)*
GAPS	Grant Administration and Payment System *(Department of Education)*
HHS	Department of Health & Human Services
HUD	Department of Housing & Urban Development
IT	Information technology
IVPN	Integrated Profile Vendor Network
J2EE	Java 2 Enterprise Edition
LDAP	Lightweight Directory Access Protocol
NASA	National Aeronautics and Space Administration
NIH	National Institutes of Health *(Department of Health & Human Services)*
NSF	National Science Foundation
ONR	Office of Naval Research *(Department of Defense)*
NOAA	National Oceanic and Atmospheric *Administration (Department of Commerce)*
P.L. 106-107	Public Law 106-107, the Federal Financial Assistance Management Improvement Act of 1999
RFI	request for information
SMTP	Simple Mail Transport Protocol
TIN	Tax Identification Number
XML	eXtensible Markup Language